OCCASIONAL NOTES.

EARTHQUAKE IN THE MALAY PENINSULA.

The rarity of earthquakes in the Malay Peninsula is somewhat remarkable, as though the volcanic belt of the Archipelago is absolutely outside this region, it approaches so near that one would imagine that disturbances would constantly make themselves felt here.

From time to time tremors more or less faint have been experienced in Singapore, but no record seems to have been kept of these. It is stated by residents that a shock equalling in intensity the one which shook Singapore and a large portion of the Peninsula on the night of May 17th, 1892, was felt in 1861, but no details of this earlier occurrence were preserved. The recent shock occurred at 8.10 p.m., and at Tanglin it commenced comparatively lightly and increased rapidly in violence till the whole house was violently shaken, so that glasses and furniture rattled and doors kept banging to and fro, and then it gradually died away.

The duration of the tremors was very variously reported by observers as from six seconds to three minutes, but no one seems to have taken an accurate record. At Tanglin it seemed, as nearly as I could judge (for I did not notice its commencement), to be nearly four minutes before the vibration of the house had entirely died away, but the violent period I estimated at about a minute's duration. One observer, Mr. T. A. WANDALE, residing at Pasir Panjang, noticed two distinct oscillations, the first lasting apparently thirty seconds, the second (which was more violent) with very distinct undulations lasting for about twenty-five seconds, there being an almost complete cessation of movement for ten seconds between the two waves. In Deli (Sumatra) "the shocks were more severe and had a slow, rolling and tremulous motion culminating in a heavy

shock which occurred three times in succession." (*Straits Times*). No distinct shocks were felt in any part of the Peninsula, nor was any sound heard during the tremors, except that of the moving timbers, glasses, etc. No damage is reported from any part of the Peninsula, nor any absolute displacement of furniture, except that at Telok Ayer (Singapore) where a lamp glass and ruler were shaken off a table upon the floor. Much damage, however, is reported at Padang Sidempuan in Tapanuli district, Sumatra, and also to a less extent in Deli, and Rantan Perapat. In Singapore much alarm was caused to the natives, who ran out of their houses, and one Chinaman was so frightened that he leaped out of a window and broke his leg. Mr. Justice GOLDNEY reports that just before the shock was felt a number of black and white robins (*Copsycus musicus*) flew into the house, and some were caught by the cat.

No tidal wave was observed on the Singapore coasts, but at Muar, a steamer lying at the wharf was moved repeatedly, and off Singapore and Johor ships and boats were rocked about.

The earthquake was felt all over Singapore, in Johor, Muar, Malacca, Jelebu, Penang, Province Wellesley and at Pekan, besides the places mentioned in Sumatra, but not in Borneo nor Java. In certain spots in Singapore nothing was noticed, such were Government Hill and Fort Canning. It is well known that earthquakes have a habit of skipping over certain places, which spots have been termed "earthquake bridges." MILNE (Earthquakes, p. 141) says: "When an elastic wave passes from one bed of rock to another of a different character a certain portion of the wave is transmitted and refracted and bridges we may conceive of as occurring where the phenomenon of total refraction occurs." It is possible that this may account for the absence of the tremors in these spots, but in some cases where nothing was noticed, the observers were walking or standing on the ground, and the shock being comparatively weak was not perceived as it was by persons in wooden houses on piles which naturally were more unstable and thus would move with the slightest shock. The tremors

were all horizental, and in the Peninsula ran from West to East. From the nature of the vibrations it may be suggested that the shock itself was at a considerable distance from Singapore. The exact direction in which the wave ran does not appear to be quite certain, as no one seems to have attempted to settle it by experiment at the time. From Malacca the vibrations are reported to have come from the N.N.W. and this is probable as they were more violent at Deli which is N.N.W. of Malacca. At Pasir Panjang they apparently travelled S.S.W. to N.N.E. or from S.W. to N. E. At Tanglin they appeared to travel from S.W. to N.E., but from the movements of a certain door, I believe they were really from the North-West.

In Medan, on the other hand they were felt as travelling from East to West. If this is correct, the starting point of the shocks must have been somewhere between South of Deli and North of Malacca, and a volcano called Sarek Berapi is said to have been the one from which the vibrations started. In conclusion, it is, I think, worth remarking that the weather for some time before the earthquake occurred was remarkably hot and oppressive in Singapore, as unusually hot weather has in other cases of earthquake been observed as preceding the shock.

H. N. R.

ON THE OCCURRENCE OF THE RARE BAT-HAWK IN JOHOR.

In December last, the Bird Collector of the Raffles Museum shot in Johor a fine specimen of the very rare Hawk, *Machœrhamphus alcinus* (Westerm.).

Of the genus *Machœrhamphus*, only two species are known, viz., this one and *M. Andersoni*, whose habitat is Damara Land in South-West Africa, and Madagascar.

With reference to *M. alcinus*, Mr. E. W. OATES in his "Birds of British Burmah" says :—

"The slender-billed Pern is a very rare species, about which "little is known. Mr. HOUGH procured one specimen at